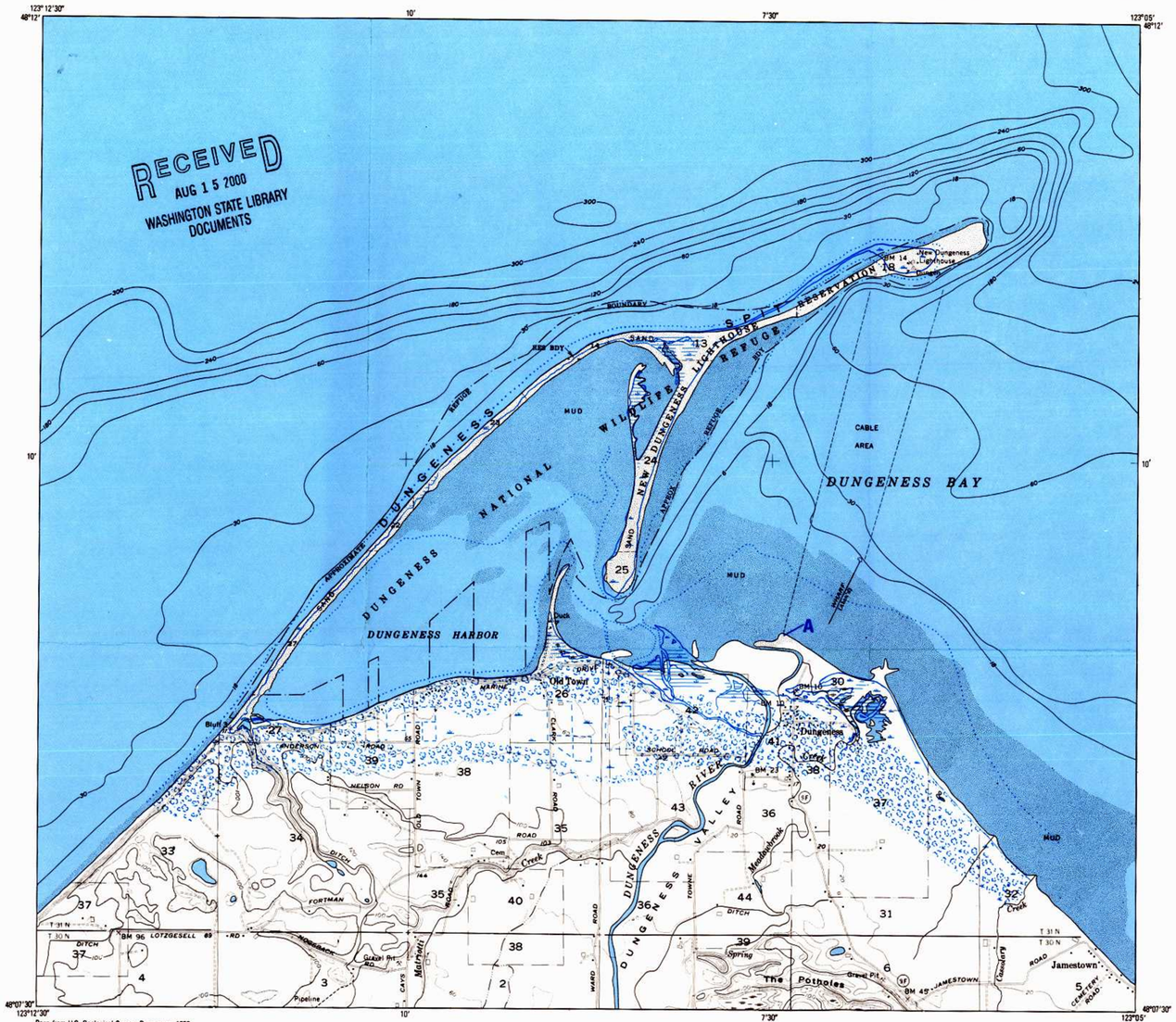
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in cooperation with the
U.S. DEPARTMENT OF JUSTICE AND THE BUREAU OF INDIAN AFFAIRS

HYDROLOGIC INVESTIGATIONS
ATLAS HA-617 (SHEET 11)



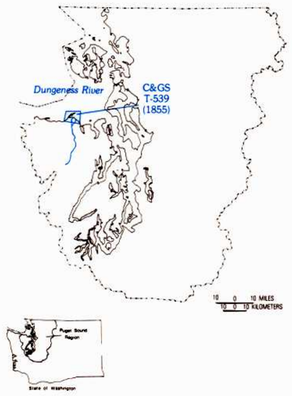
Base from U.S. Geological Survey, Dungeness, 1956.

EXPLANATION

Symbols for historical map	Features	Symbols for present-day map
A	Spit near Dungeness River mouth	
	Shoreline	
	Mean lower low-water line	Seaward edge of intertidal wetland
	Boundaries for agricultural plots	Not shown
	Subaerial wetland (salt-water or fresh-water marsh)	
Area between shoreline and lower low-water line	Intertidal wetland	
	Forested upland	Not shown
	Grassland	Not shown

Summary of Environmental Changes and Some Planning Considerations

Progradation (seaward advance of shoreline)	Substantial. The delta has prograded significantly. For example, the area shown as "A" on the map, apparently prograded an average of 13 m per year from 1941 to 1956. Dungeness Spit has grown in a northeastern direction at an average rate of 4.5 m per year from 1855 to 1976. However, this growth of the spit is primarily the result of marine, rather than riverine, processes.
Recession (landward retreat of shoreline)	Substantial locally. Near the former river mouth, the shoreline has receded several hundred meters.
Channel migration	Substantial. The Dungeness River channel has shifted several hundred meters to the east of its 1855 position.
Channel straightening	None apparent.
Diking or substantial filling of subaerial delta land near salt-water shoreline	None apparent.
Diking or substantial filling near stream banks	A dike has been built along the eastern side of the Dungeness River; this has blocked off a former distributary channel that once flowed to Dungeness Bay.
Other artificial landfill on subaerial delta land	None apparent.
Landfill on intertidal delta land	None apparent.
Loss of subaerial wetland	None apparent. The present-day marsh is 0.5 sq km (not all shown on base map), about the same as on the 1855 map (table 2).
Loss of intertidal wetland	None apparent.
Some planning considerations	The Dungeness River delta and spit are in a relatively natural state, but significant progredation and local erosion have occurred near the river mouth and spit. The wetland and the relatively unmodified shorelines, if managed properly, can retain the benefits of valuable fish and wildlife habitat. The relatively rapid progradation of Dungeness Spit and the delta shoreline reflect major sediment loads carried by the Dungeness River and eastward-flowing marine currents along the shore of the Strait of Juan de Fuca west of Dungeness Spit.



SOURCE MAPS FOR COMPILATION OF HISTORICAL SHORELINE AND LOCATION OF RIVER-MOUTH DELTA

DUNGENESS RIVER AND DUNGENESS BAY

Setting

The Dungeness River flows from the Olympic Mountains to Dungeness Bay, a spit-formed embayment along the eastern Strait of Juan de Fuca. Dungeness Bay and Spit are within the Dungeness Wildlife Refuge. The river delta is relatively small and includes marsh near the river mouth and agricultural land in higher areas.

Shoreline and Wetland Changes

At the time of 1855 mapping, the Dungeness delta included marsh, grassland, and cleared agricultural land. Parcels of land on the Dungeness delta were first diked in the 1850's (Washington State, undated manuscript). Since the early mapping, the shoreline of Dungeness Spit and delta have changed considerably. However, because part of the delta has prograded and because of the absence of dikes near the sea, the net loss of wetlands since 1855 appears to be minimal.

Shoreline changes of the Dungeness delta include the apparently natural shifting of the Dungeness River channel and local progradation, as well as some erosion of the subaerial part of the delta near the river mouth. Dungeness Spit has grown seaward in a northeasterly direction.

Compilation of Map

The 1855 topographic survey (T-539) was the source of the historical map data. Selected topographic features—namely, the ravine of steep relief at the head of the main spit and the bluffs along the south shore—provided control for the data transfer. Significant discrepancies were found between the old and new maps, especially in the positions of appendages of the spit. Because of these differences and the lack of a land grid on the old map, aerial photographs taken in 1941 and 1975, and a sequence of topographic maps dated 1907–08 and 1926, were obtained and used for further evaluation. The discrepancies between the older and newer maps are believed to represent an inaccuracy in the original survey rather than a migration of the outer and inner appendages of Dungeness Spit; a lateral adjustment of as much as 4 mm (.16 in) at the 1:24,000 scale was made during data transfer to bring the appendages into reasonable agreement with the modern map.

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HISTORICAL CHANGES OF SHORELINE AND WETLAND AT DUNGENESS RIVER AND DUNGENESS BAY, WASHINGTON

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